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Trauma symptoms, sleep quality and related factors in the early post-earthquake period

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ABSTRACT

Aim: Traumatic life events such as earthquake are frequently encountered problems both in our country and all over the world. The aim of this study was to determine sleep quality, trauma level and related factors and to evaluate the effects of gender, damage status and losses in adults who were admitted to the psychiatry outpatient clinic among individuals who were placed six thousand kilometers far away from their residence in Kırıkkale University student dormitories immediately after the 6 February 2023 earthquakes that affected a wide geography in Turkey.

Methods: 64 volunteers were included in the study between March 2023 and June 2023. After the participants' complaints and sociodemographic characteristics were questioned, the Pittsburgh Sleep Quality Index (PSQI) and the Scale That Determines the Level of the Trauma after the Earthquake (PETLDS) were applied to the participants to determine their sleep quality and trauma levels after the earthquake.

Results: The mean age of the participants was 45.5±15.5, and 75.0% of them were women. Fear/anxiety and insomnia were the most frequently reported complaints by the participants. The mean of the participants' PSQI scores was 10.5±4.4, and 43 participants (79.6%) had poor sleep quality in the last month. The mean score of the participants' PETLDS was determined as 76.6±17.9. When the subscales were examined, it was determined that the emotional limitation and cognitive restructuring scores were higher than the behavioral, affective and sleep problems. When the participants were compared in terms of damage in their homes, it was found that the participants with moderately or more damaged houses had statistically higher emotional, cognitive restructuring and sleep problems and total trauma scores compared to the participants with a solid or slightly damaged house (respectively; p=.017, p=.023, p=.010, p=.040). Individuals with moderately or more damaged houses had higher PSQI scores but this difference did not reach statistical significance (p=.061). However, parameters such as age, female gender, history of psychiatric illness, loss of loved ones, damage status of house, and PSQI score did not yield an association with high-level trauma symptoms (PETLDS score above 52.3) in univariate logistic regression analysis.

Conclusion: Female gender, young age, damage status of house, losing loved ones and history of psychiatric illness are associated with high-level trauma symptoms and poor sleep quality after the early period of earthquake with no statistical significance.

Keywords: Earthquake, public health, sleep disorders, trauma

INTRODUCTION

Traumatic life events are frequently encountered problems both in our country and all over the world. Approximately 2/3 of people in the general population experience a significant traumatic event at any time in their lives. Disasters are traumatic events that many people experience and can lead to extensive physical and mental health problems.[1,2] Although natural disasters affect many people at the same time, according to World Mental Health Survey data, the prevalence of traumatic stress symptoms after natural disasters is between 0.01-3.8%.[3,4]

Earthquakes have an important place among natural disasters because they are effective in a wide area, occur suddenly, are unpredictable, affect large masses due to the destruction, death and injuries they cause, create many additional problems and can also create chronic effects due to aftershocks.[5-7] Among natural disasters, the type of disaster that causes the most loss of life and property is earthquake, and 90% of our country's territory, 95% of the population and 75% of industrial zones are on the earthquake

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zone.[6,8] Problems such as infrastructure inadequacies, failure to meet basic needs, disruption of health services, failure to solve the housing problem quickly, continuation of aftershocks, failure to ensure the return of life to its natural flow, inability of earthquake victims to reach their relatives and disruption of funeral procedures make the destructive effects of the earthquake massive and lead to prolongation of the trauma period.[8]

When the factors associated with trauma symptoms that develop after disasters are examined, it has been shown that factors such as female gender, past/comorbid psychiatric diagnosis, low social support, and degree of exposure to the disaster may be risk factors.[1] Some researchers have shown that variables such as the level of damage in the location of the earthquake, loss of relatives, and forced displacement may be effective on trauma symptoms.[4,6,8] Depending on the magnitude of the earthquake, there may be individual differences in the reactions of those exposed to the disaster, and these symptoms can be classified as emotional, physical, cognitive and social.[9,10] Acute stress reactions such as shock, fear, helplessness, anger, shame and guilt, inability to focus, emotional blunting, forgetfulness, images and memories of the earthquake, restlessness, tension, weakness, startle, palpitations, nausea, changes in sleep and appetite, intolerance, social isolation, feeling lonely and insecure can be seen immediately after the earthquake.[9,11-13]

When the literature was examined, it was observed that most of the psychosocial studies conducted after the earthquake were conducted after a certain period after the earthquake. However, many studies emphasise the importance of assessments to be made in the acute period after the earthquake in terms of the development of psychopathology and the effectiveness of therapeutic approaches.[14] The aim of this study was to determine sleep quality, trauma level and related factors and to evaluate the effects of gender, damage status and losses in 64 adults who were admitted to the psychiatry outpatient clinic among individuals who were placed in Kırıkkale University student dormitories immediately after the 6 February 2023 earthquakes that affected a wide geography in Turkey.

METHODS

The study was carried out with the permission of the Kırıkkale University Non-interventional Clinical Researches Ethics Committee (Date: 29.03.2023, Decision No: 2023.03.18). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. Written informed consent was obtained from the participants.

The population of this descriptive study consisted of earthquake-affected individuals who left the city where they experienced the earthquake and were placed in Kırıkkale University student dormitories immediately after the earthquakes whose epicentres were Kahramanmaras, Pazarcik or Elbistan on 6 February 2023 and who applied to Kırıkkale University Faculty of Medicine Psychiatry Outpatient Clinic between March 2023 and June 2023 and agreed to participate in the study. The aim of the study was to evaluate the socio-demographic characteristics and complaints of the volunteers, to determine their sleep quality and post-earthquake trauma levels and to determine the related factors affecting them.

As a data source, a personal information form prepared by the researchers, consisting of fifteen questions inquiring some socio-demographic characteristics of earthquake-affected individuals such as age, gender, marital status, education level, and the province where the earthquake occurred was applied to participants. Afterwards, the Pittsburgh Sleep Quality Index (PSQI) and the Scale That Determines the Level of the Trauma after the Earthquake (PETLDS) were used to determine their sleep quality and the level of trauma they experienced after the earthquake.

Developed by Tanhan and Kayri in 2013, PETLDS is a five-point Likert-type measurement tool that measures the trauma symptoms experienced by individuals after the earthquake. The scale consists of 20 items and 5 dimensions ('behaviour problems', 'emotive limitedness', 'affective', 'cognitive structures', 'sleep problems'). The internal consistency coefficient calculated to determine the reliability of the scale was found to be .87. A score in the range of 52.3±5.1 corresponds to a threshold value indicating that individuals are traumatised. A score above or below this value indicates a high or low level in showing post-earthquake traumatic symptoms.[15]

The PSQI was developed by Buysse et al.[16] in 1989 and adapted into Turkish language by Agargun et al.[17] The PSQI is a 19-item self-report scale that assesses sleep quality and sleep disturbance in the past one month. The scale consists of 24 questions. 19 questions are self-report questions, and the other 5 questions are questions to be answered by the spouse or roommate. The 18 scored questions of the scale consist of 7 components: Subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, sleep medication use and daytime dysfunction. Each component is evaluated on a 0–3-point scale. The total score of 7 components gives the total score of the scale. The total score ranges from 0-21. A total score greater than 5 indicates poor sleep quality.

Statistical Analysis

Statistical analysis of the study were performed with SPSS 20.0 package programme. After descriptive statistical analyses, the results were expressed as percentage distribution or mean ± standard deviation. The normal distribution of the data was analysed using the Kolmogorov-Smirnov test. Independent sample t test was used for intergroup comparisons. Logistic regression analysis was performed to evaluate predictors of high-level trauma symptoms (PETLDS score above 52.3). Variables that could be associated with high-level trauma symptoms such as age, gender, psychiatric illness history, damage status of house, loss of loved ones and PSQI score were tested in logistic regression analysis and a p value <.1 was considered as significant for univariate tests. For all statistical analyses, significance level was accepted as p value <.05.

RESULTS

Of the 64 participants, 48 were female (75.0%) and 51 were married (79.7%). The mean age of the participants was 45.5±15.5 and the age range varied between 18 and 79. While 34.4% of the participants stated their education level as primary school, the rate of university graduates was 26.6% and the rate of high school graduates was 17.2%. 23 (37.0%) of the participants stated that they experienced the earthquake in Hatay, 19 (30.6%) in Kahramanmaras, 9 (14.5%) in Malatya, 6 (9.6%) in Adiyaman, 3 (4.8%) in Osmaniye and 2 (3.2%) in Gaziantep. 39.1% of the participants stated that the place where they stayed was severely damaged during the earthquake, and 9.4% stated that the building was destroyed. 39 people (60.9%) stated that they lost at least one relative due to the earthquake. Three of the participants stated that they lost their mother, one of them lost their father, two of them lost their siblings, and one of them lost their spouse; 25 of them lost their close relatives, and 17 of them lost their close friends (Table 1).

When participants were asked about the symptoms for applying to Kırıkkale University Faculty of Medicine Psychiatry Outpatient Clinic, the most common complaints were fear/anxiety (n=39, 67.1%) and sleep disturbance (n=34, 58.5%). Anorexia was reported by 7 people and other complaints included inability to stay still, inability to enter a closed area, shortness of breath, nervousness, reluctance, numbness in the mouth and jaw, restlessness, startle, crying, palpitations, and irritability. Twenty-four of the participants (39.3%) stated that they had a previous history of psychiatric illness (Table 2).

Table 1. Distribution of socio-demographic characteristics of participants

Characteristics	n	%
Gender		
Woman	48	75.0
Man	16	25.0
Marital status		
Single	10	15.6
Married	51	79.7
Divorced/Deceased	3	4.7
Education status		
Illiterate	4	6.3
Literate	4	6.3
Primary School	22	34.4
Middle School	6	9.4
High School	11	17.2
University	17	26.6
Location during the earthquake		
Adiyaman	6	9.6
Gaziantep	2	3.2
Osmaniye	3	4.8
Malatya	9	14.5
Kahramanmaras	19	30.6
Hatay	23	37.0
Damage to the residence during the earthquake		
Slightly damaged	18	28.1
Moderately damaged	15	23.4
Heavily damaged	25	39.1
Destroyed	6	9.4
Loss of loved ones due to earthquake		
Yes	39	60.9
No	25	39.1

Table 2. Distribution of participants' reasons for applying to mental health and diseases outpatient clinics and having a history of psychiatric disease

Applicant's complaint*	n	%
Sleep disturbance	34	58.5
Fear/anxiety	39	67.1
Loss of appetite	7	12.0
Other**	19	32.6
History of psychiatric illness***		
Yes	24	39.3
No	37	60.7

*Six of the participants did not specify any complaints, and there were participants with more than one complaint. **Other: Restlessness, startle, palpitations, crying, irritability. ***Three of the participants did not state whether they had a history of psychiatric illness.

The mean PSQI score of the participants was calculated as 10.5±4.4. Since the cut-off score of the scale was 5, it was determined that 43 participants (79.6%) had poor sleep quality in the last month. The mean score of the participants in the PETLDS was calculated as 76.6±17.9. When the subscales were examined, it was found that emotive limitedness and cognitive structures scores were higher than behaviour problems, affective and sleep problems (Table 3).

Table 3. Distribution of participants' PETLDS and PSQI scores

	Mean ± Standard Deviation
PSQI	10.5±4.4
PETLDS	76.6±17.9
Behaviour Problems	13.3±4.1
Emotive Limitedness	18.1±8.8
Affective	14.0±4.5
Cognitive Structures	18.2±3.7
Sleep Problems	12.8±3.6

PSQI = The Pittsburgh Sleep Quality Index, PETLDS= The Scale That Determines the Level of the Trauma after the Earthquake.

When the participants were compared in terms of damage to their homes, it was found that the participants with moderate or more damaged homes had statistically higher affective, cognitive structures, sleep problems and total trauma scores than the participants with intact or slightly damaged homes (p=.017, p=.023, p=.010, p=.040, respectively). The PSQI scores of individuals with medium or more damaged houses were found to be higher, but this difference did not reach statistical significance (p=.061) (Table 4).

Table 4. The relationship between the damage status of the houses of the participants and their PETLDS and PSQI scores

	Intact/ slightly damaged (n=17)	Moderately/ heavily damaged/ demolished (n=45)	p value
PSQI	8.6±4.8	11.2±4.1	.061
PETLDS	69.3±26.8	79.3±12.5	.040*
Behavioural problems	11.8±4.1	13.8±4.1	.092
Excitement limitation	18.2±14.7	18.1±5.4	.961
Affective	11.8±4.2	14.8±4.4	.017*
Cognitive structuring	16.4±6.1	18.8±1.9	.023*
Sleep problems	10.9±4.9	13.6±2.7	.010*

PSQI = The Pittsburgh Sleep Quality Index, PETLDS = The Scale That Determines the Level of the Trauma after the Earthquake.

All parameters including age (OR: 1.04, 95% CI: 0.98-1.10, p=.190) female gender (OR: 3.66, 95% CI: 0.65-20.53, p=.139), history of psychiatric illness (OR: 0.27, 95% CI: 0.04-1.62, p=.153), loss of loved ones (OR: 0.83, 95% CI: 0.14-4.94, p=.841), damage status of house (OR: 2.6, 95% CI: 0.13-50.04, p=.190) and PSQI score (OR: 1.11, 95% CI: 0.86-1.43, p=.412) did not yield an association with high-level trauma symptoms in univariate logistic regression analysis (Table 5).

Table 5. Associates of high-level trauma symptoms by logistic regression analysis

	Univariate	
	Odds Ratio (95%CI)	P value
Age	1.04 (0.98-1.10)	.190
Gender	3.66 (0.65-20.53)	.139
Psychiatric illness history	0.27 (0.04-1.62)	.153
Loss of loved ones	0.83 (0.14-4.94)	.841
Damage status of house	2.60 (0.13-50.04)	.527
PSQI score	1.11 (0.86-1.43)	.412

PSQI = The Pittsburgh sleep quality index

DISCUSSION

In our study, post-earthquake trauma symptoms, sleep quality and related factors were examined in individuals who were affected by the earthquakes whose epicentres were Pazarcik and Elbistan districts of Kahramanmaras, respectively, on 6 February 2023 and who had to change their cities and settled in Kırıkkale University student dormitories, which is approximately six hundred kilometres away from the epicentres of earthquakes. We found that female gender, young age, damage status of house, losing loved ones and history of psychiatric illness are associated with high-level trauma and poor sleep quality after the early period of earthquake with no statistical significance.

According to our descriptive results obtained, the mean PETLDS total score of the individuals was calculated as 76.6±17.9 and in this direction, it was determined that the participants were traumatised after the earthquake. The score range of 52.3±5.1 to be taken from PETLDS indicates a threshold value pointing that individuals were traumatized after the earthquake.[15] It was found that the mean scores of the excitement limitedness and cognitive structuring sub-dimensions were higher (18.1±8.8, 18.2±3.7, respectively) than the mean scores of the behavioural, affective and sleep problems sub-dimensions (13.3±4.1, 14.0±4.5, 12.8±3.6, respectively). Similar results were obtained in a recent study using the PETLDS.[18] According to the results of research conducted by Aynur Karabacak Celik, excitement limitedness and cognitive structuring scores were higher (16.9±5.4, 17.0±3.2, respectively) than other sub-dimensions of PETLDS.[18] Since items in sub-dimension of 'excitement limitedness' mostly contain hopelessness and depressive elements (e.g., 'It feels like life has no meaning anymore', 'I feel very helpless/powerless'); this can be expected to be higher in the individuals affected by earthquake. Besides, 'cognitive structuring' contains anxiety related items such as 'I am irritated because of the thought that an earthquake will occur at any moment', 'I am worried about the future'. It is known that anxiety and depressive symptoms are very common in people at post-earthquake period.[19,20] In this context, high scores of cognitive structuring and excitement limitedness in our study are consistent with the literature.

In a study conducted in China, Jiang et al.[21] demonstrated that 83.2% of the participants had sleep problems according to PSQI scores. In our study, the PSQI scores of the individuals exposed to earthquake were found to be high (10.5±4.4) and a total of 43 (79.6%) individuals scored greater than 5 which indicates poor sleep quality. This higher rate of sleep disturbances seen in the early period after natural disasters may be related to decreased sense of security and avoidance behaviour.[12] Increasing

line of evidence show that sleep disturbance is a core feature of PTSD rather than an accompanying symptom. Furthermore, post-earthquake sleep quality of individuals was significantly predictive of anxiety, depression, and PTSD development as shown in studies. [21]

In studies investigating the psychological effects of earthquakes, it has been emphasised that anxiety, depression, dissociation, physical symptoms and sleep disorders may be observed in individuals after an earthquake.[12,22] In the results of studies conducted shortly after the Iranian earthquake in 2017, it was found that individuals affected by earthquake experienced anxiety with 70%, stress with 60%, depressive symptoms with 41.5% and sleep disorders with 20%.[19] In a study, the first three most common symptoms after the earthquake were sadness 75%, sleep disturbance 75% and anxiety 61%.[20] In a study conducted after the Elazığ earthquake, Bilici et al.[8] found fear as the most common complaint (73.3%). Similarly, the two most common symptoms in our study were fear/anxiety (n=39, 67.1%) and sleep disturbance (n=34, 58.5%).

The extent to which individuals will be affected by the earthquake is generally parallel to how close they are to the epicentre. Individuals who were injured in the earthquake, lost their relatives, had their homes/workplaces destroyed, were buried under the rubble, and whose neighbourhood was destroyed may be more emotionally affected.[12] In studies conducted after the Van 2019 earthquake, it was found that the post-traumatic stress symptoms of the participants were significantly different in terms of the variables of loss of relatives in the earthquake, experiencing the earthquake, damage of the house they live in and being buried under the rubble.[6,23] According to the research conducted in two different regions of Marmara after the Istanbul earthquake, Basoglu et al.[24] suggested that damage to home was significant but weak predictor of traumatic stress symptoms. In our study, individuals with more severe damage in their homes were found to have higher scores on the PETLDS (total score: 79.3±12.5, p=.04; sleep problems sub-dimension:13.6±2.7, p=.01) and PSQI (11.2±4.1, p=.61).

In the literature, it has been shown that there is a relationship between female gender and past/comorbid psychiatric diagnosis and traumatic symptoms.[1,20] Approximately three-quarters of the individuals who participated in this study were women (n=48) , and although not statistically significant, women had higher scores on the PETLDS and PSQI (77,5±18.1, p=.48; 10.6±4.7, p=.70, respectively). In our study, 24 individuals with a psychiatric history had higher scores on the PETLDS and PSQI, but this difference was not statistically significant (78,8±17.6, p=.21; 11.1±4.1, p=.22, respectively). The mean age of the participants in our study was 45.5±15.5 years and the age range were between 18 and 79 years. Although younger participants aged under 45 had higher PETLDS and PSQI scores (77,2±19.1, p=.77; 11.1±4.3, p=.35, respectively), no significant relationship was found between age and trauma level and sleep disturbance. While previous studies have indicated that being young is a risk factor for trauma symptoms, the fact that the sample of our study consisted mostly of middle-aged and older participants may have caused the effect of age not to be shown.4 Studies investigating the relationship between loss of a relative in an earthquake and psychiatric symptoms have yielded conflicting results.[12,20] In our study, trauma and sleep scores of individuals who lost a relative in the earthquake were lower (75,8±15.0, p=.66; 10.5±4.3, p=.97, respectively), but not statistically significant.

Furthermore, we aimed to evaluate whether the abovementioned parameters such as age, gender, history of psychiatric illness, loss of loved ones, damage status of house and PSQI score predict high-level trauma symptoms through logistic regression analysis. Nevertheless, none of the parameters included in univariate tests yielded a statistically significant relationship with high-level trauma symptoms which could be due to observative nature, descriptive design and small number of participants compared to other studies.[4,6,24] It should be underlined that evaluation of the participants at the early period, small number of participants and conducting the study far from the epicentre of the earthquake might have been reasons for failed regression analysis. For example, a previous study showed that the psychological reactions of individuals after damaging traumas are not in the dimension of the severity of the events. The concept of posttraumatic growth can be defined as positive psychological changes that develop after challenging life events.6 It may be considered that the low scores observed in our study may be related to posttraumatic growth.

There are many studies in the literature published from Turkey and the world that evaluated psychiatric disorders of individuals after earthquakes.[2,4-6,8,19-21,23,24] At this point, it is reasonable to question the scientific contribution of our study. Because the earthquakes that occurred on 6th February of 2023 affected a very wide geographical region and one of the largest earthquakes ever experienced in Turkey, evaluation of individuals that suffered from this disaster can contribute to national scientific data of Turkey. On the other hand, the participants of our study have moved approximately six hundred kilometres away from their residencies and lived in student dormitories of a university for a while. To our knowledge, there is no data in the literature both from

Turkey as well as the world that evaluated the psychiatric status of such individuals. From this perspective, our data can give valuable insights to scientific literature.

The most important limitation of our study is that the participants could not be followed up longitudinally and could not be evaluated in terms of the rates of development of Acute Stress Disorder (ASD) and PTSD. Exploratory and descriptive design of the study is a significant limitation that limits to make firm conclusions about trauma symptoms related with earthquake. In longitudinal research dataset, we could explore the principal relationship between sleep disturbances and psychiatric disorders. In addition, the past trauma history of the participants was not questioned. Therefore, impact of past trauma on the development and severity of trauma symptoms could not be assessed. Also sample size of our study is small, which could be due to the study was conducted in a city located far from the epicentre of the earthquake. It should be underlined that, according to the relevant literature, most of the post-earthquake studies were conducted long after the trauma. Despite the small sample size, the fact that the examination was conducted in the early period is a strength of our study. Additionally, it is emphasized that evaluation in the early period is important in terms of the development of psychopathology and the effectiveness of therapeutic approaches.[8,21] Future prospective, well-designed and statistically powered studies are needed to clarify the long-term prevalence of psychiatric morbidity among individuals after major disasters. In line with this, our observational and descriptive study results should be considered hypothesis-generating only. On the other hand, whether providing education to the individuals about the symptoms they may experience and coping methods in the early period after the earthquakes should be the subject of future studies.

CONCLUSION

The earthquakes that occurred in our country on and after 6 February 2023 covered a large area and resulted in millions of people being directly affected and the rest of the society being indirectly affected at various levels. Our study results indicate that being female, at a younger age, damage status of house, losing loved ones and history of psychiatric illness are associated with high-level trauma and poor sleep quality after the early period of earthquake with no statistical significance.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of the Kırıkkale University Non-interventional Clinical Researches Ethics Committee (Date: 29.03.2023, Decision No: 2023.03.18).

Informed Consent: Written informed consent was obtained from the participants.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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REFERENCES

1. Galea S, Nandi A, Vlahov D. The epidemiology of post-traumatic stress disorder after disasters. *Epidemiol Rev.* 2005;27:78-91.
2. Ehring T, Razik S, Emmelkamp PM. Prevalence and predictors of posttraumatic stress disorder, anxiety, depression, and burnout in Pakistani earthquake recovery workers. *Psychiatry Res.* 2011;185(1-2):161-166. doi:10.1016/j.psychres.2009.10.018
3. Bromet EJ, Atwoli L, Kawakami N, et al. Post-traumatic stress disorder associated with natural and human-made disasters in the World Mental Health Surveys. *Psychol Med.* 2017;47(2):227-241.
4. Cankardaş S, Sofuoğlu Z. Deprem ya da yangin deneyimlemis kisilerde travma sonrasi stres bozuklugu belirtileri ve belirtilerin yordayicilari. *Turk J Psychiatry.* 2019;30(3):151-156.
5. Sabuncuoğlu O, Çevikaslan A, Berkem M. Marmara depreminden etkilenen iki ayrı bölgede ergenlerde depresyon, kaygı ve davranış. *Klinik Psikiyatri.* 2003;6:189-197.
6. Kardaş F, Tanhan F. Van depremini yaşayan üniversite öğrencilerinin travma sonrası stres, travma sonrası büyüme ve umutsuzluk düzeylerinin incelenmesi. *Van Yüzüncü Yıl Üniversitesi Eğitim Fakültesi Derg.* 2018;15(1):1-36.
7. Kuman Tuncel O. Deprem, kitlesel travma ve sonrası. *Nöropsikiyatri Arşivi*. 2023;60(2):97-98.
8. Bilici R, Tufan E, Turhan L, Uğurlu GK, Serap T, Kaşan T. Deprem sonrasında bireylerin anksiyete düzeyleri ve etkileyen faktörler: Elazığ merkezli bir ön çalışma. *Fırat Tıp Derg.* 2013;18(1):15-19.
9. Biçakci AB, Okumuş FEE. Depremin psikolojik etkileri ve yardım çalışanları. *Avrasya Dosyası.* 2023;14(1):206-236.
10. Uğur M, Kartal F, Mete B, Tamam L, Demirkol ME. Deprem sonrası akut stres bozukluğu olanlarda travma esnasındaki çözülmenin, anksiyete düzeyi, algılanan stres, anksiyete duyarlılığı ve deprem stresiyle baş etme ile ilişkisi. 2021;32(4):253-260.
11. İşikli S, Tüzün Z. Afetlerin akut dönem psikolojik etkilerine yönelik psikososyal müdahale yaklaşımları. *Türkiye Klinikleri.* 2017;2(3):180-188.
12. Yildiz Mİ, Başterzi AD, Yildirim EA, et al. Deprem sonrası erken dönemde koruyucu ve tedavi edici ruh sağlığı hizmeti-Türkiye Psikiyatri Derneği uzman görüşü. *Turk J Psychiatry.* 2023;34(1):39-49.
13. Taşçi GA, Özsoy F. Deprem travmasının erken dönem psikolojik etkileri ve olası risk faktörleri. *Cukurova Med J.* 2021;46(2):488-494.
14. Hacıoğlu M, Aker T, Kutlar T, Yaman M. Deprem tipi travma sonrasında gelişen travma sonrası stres bozukluğu belirtileri alt tipleri. *Düşünen Adam: Psikiyatri ve Nörolojik Bilimler Derg.* 2002;15:4-15.
15. Tanhan F, Kayri M. Deprem sonrası travma düzeyini belirleme ölçeğinin geçerlik ve güvenirlik çalışması. *Kuram ve Uygulamada Eğitim Bilimleri.* 2013;13(2):1013-1025.
16. Buysse DJ, Reynolds III CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh sleep quality index: a new instrument for psychiatric practice and research. *Psychiatry Res.* 1989;28(2):193-213.

17. Ağargün MY, Kara H, Anlar Ö. The validity and reliability of the Pittsburgh sleep quality index. *Turk Psikiyatri Derg.* 1996;7(2):107-15.
18. Çelik AK. Deprem sonrası travma belirtileri, umut ve iyi oluş arasındaki ilişkinin incelenmesi. *TRT Akademi*. 2023;8(18):574-591.
19. Bavafa A, Khazaie H, Khaledi-Paveh B, Rezaie L. The relationship of severity of symptoms of depression, anxiety, and stress with sleep quality in earthquake survivors in Kermanshah. *J Inj Violence Res.* 2019;11(2):225-232.
20. Sharan P, Chaudhary G, Kavathekar SA, Saxena S. Preliminary report of psychiatric disorders in survivors of a severe earthquake. *Am J Psychiatry.* 1996;153(4):556-558.
21. Jiang S, Yan Z, Jing P, Li C, Zheng T, He J. Relationships between sleep problems and psychiatric comorbidities among China's Wenchuan earthquake survivors remaining in temporary housing camps. *Front Psychol.* 2016;7:1552.
22. Sönmez MB. Depremin psikolojik etkileri, psikolojik destek ve korkuyla baş etme. *TOTBİD Derg*. 2022;21(3):337-343.
23. Ediz K, Gülbahçe A. Van depremini yaşayan öğrencilerin travma sonrası stres bozukluğu düzeylerinin incelenmesi. *Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Derg*. 2019;23(3):957-972.
24. Başoğlu M, Kiliç C, Şalcioğlu E, Livanou M. Prevalence of posttraumatic stress disorder and comorbid depression in earthquake survivors in Turkey: an epidemiological study. *J Traumatic Stress.* 2004;17(2):133-141.